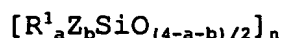


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## CLAIMS

1. A method of deinking printed paper, the method comprising pulping the paper to form an aqueous slurry, adding a deinking  
5 additive to the paper, and removing detached ink by flotation, wherein the additive comprises an organo-modified siloxane comprising units of the formula:



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in which each  $R^1$  is independently selected from a hydrogen atom, an alkyl, aryl, alkenyl, aralkyl, alkaryl, alkoxy, alkanoyloxy, hydroxyl, ester or ether group;

each  $Z$  is independently selected from an alkyl group  
15 substituted with an amine, amide, carboxyl, ester, or epoxy group, or a group  $-R^2-(\text{OC}_p\text{H}_{2p})_q(\text{OC}_r\text{H}_{2r})_s-R^3$ ;

$n$  is an integer greater than 1;

$a$  and  $b$  are independently 0, 1, 2 or 3;

$R^2$  is an alkylene group or a direct bond;

20  $R^3$  is a group as defined for  $R^1$  or  $Z$  above;

$p$  and  $r$  are independently an integer from 1 to 6;

$q$  and  $s$  are independently 0 or an integer such that  
 $1 \leq q + s \leq 400$ ;

and wherein each molecule of the organo-modified siloxane  
25 contains at least one group  $Z$ .

2. A method according to claim 1 wherein  $Z$  is a group  $-R^2-(\text{OC}_p\text{H}_{2p})_q(\text{OC}_r\text{H}_{2r})_s-R^3$ .

- 30 3. A method according to claim 2 wherein  $p$  and/or  $r$  are independently 2, 3 or 4.

4. A method according to claim 2 or 3 wherein  $q$  and  $s$  are

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each independently integers from 10 to 30.

5. A method according to claim 4 wherein q and s are each independently 15 to 25.

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6. A method according to any one of claims 2 to 5 wherein p is 2, r is 3, and q and s are both 18.

7. A method according to any preceding claim wherein R<sup>2</sup> is  
10 a methylene, ethylene, propylene, butylene, pentylene or  
hexylene group.

8. A method according to any preceding claim wherein R<sup>3</sup> is  
a hydrogen atom or a hydroxyl group.

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9. A method according to any preceding claim wherein the  
siloxane is linear.

10. A method according to any preceding claim wherein the  
20 siloxane contains branching.

11. A method according to any preceding claim wherein Z is  
a group  $-R^2-(OC_pH_{2p})_q(OC_rH_{2r})_s-R^3$ , and R<sup>3</sup> is a hydroxyl or  
alkanoyloxy group.

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12. A method according to any preceding claim wherein 2 to  
20 mole percent of silicon atoms in the siloxane molecule are  
substituted by a group Z.

30 13. A method according to claim 12 wherein 5 to 16 mole  
percent of silicon atoms in the siloxane molecule are  
substituted by a group Z.

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14. A method according to any preceding claim wherein the siloxane has a hydrophilic/lipophilic balance (HLB) in the range of 5.0 to 7.3.
- 5 15. A method according to any preceding claim wherein the siloxane has a molecular weight in the range of 1,000 to 500,000.
16. A method according to claim 15 wherein the siloxane has  
10 a molecular weight in the range of 10,000 to 100,000.
17. A method according to any preceding claim wherein the siloxane is a hydroxy-endcapped linear polydimethylsiloxane having an HLB of 5.9 to 6.3, in which 10 to 12 mole percent  
15 of silicon atoms are substituted by Z groups of the formula  $-R^2-(OC_pH_{2p})_q(OC_rH_{2r})_s-R^3$ , in which p is 2, r is 3 and q and s are both 18,  $R^2$  is an alkylene group having from 1 to 6 carbon atoms or a direct bond, and  $R^3$  is a hydrogen atom or a hydroxyl, ester or ether group.
- 20
18. A method according to any preceding claim wherein the additive further comprises one or more components selected from a polydimethylsiloxane, an organic polyether, and a fatty acid.
- 25
19. A method according to claim 18 wherein the additive further comprises an organic polyether of the formula  $R^4-(OC_pH_{2p})_q(OC_rH_{2r})_s-R^5$  in which  $R^4$  and  $R^5$  are selected from a hydrogen atom, hydroxyl, alkyl and alkoxy groups, p and r are  
30 independently an integer from 1 to 6, and q and s are independently 0 or an integer such that  $1 \leq q + s \leq 400$ .
20. A method according to claim 18 or 19 wherein the additive

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further comprises a fatty acid which is a saturated or unsaturated monobasic aliphatic carboxylic acid.

21. A method according to claim 20 wherein the carboxylic acid is selected from lauric, myristic, palmitic, stearic, arachidic, behenic, lignoceric, palmitolic, oleic, linoleic, linolenic, and arachidonic acids.

22. A method according to any preceding claim wherein the additive is an emulsion.

23. A method according to claim 22 wherein the additive is a gum based self-emulsifying siloxane.

24. A method according to any preceding claim wherein the additive is added to the paper in an amount within the range 0.1 to 1 wt% of the paper.

25. A method according to claim 24 wherein the additive is added to the paper in an amount within the range 0.1 to 0.5 wt% of the paper.

26. A method according to any preceding claim which is performed at substantially neutral pH.

27. A method substantially as hereinbefore described.